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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/559,403 | 04/26/2000 | Yong Beom Kim | 0214-0166P-SP | 1204 |

7590 04/30/2007
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| EXAMINER |
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NGUYEN, HOAN C

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| ART UNIT | PAPER NUMBER |
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2871

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|----------------------------------------|------------|---------------|
| 3 MONTHS | 04/30/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

09/559,403

Applicant(s)

KIM, YONG BEOM

Examiner

HOAN C. NGUYEN

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-10, 23, 24, 26 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-10, 23, 24, 26 and 28-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/06/2007 has been entered.

Claims 4, 11-22, 25 and 27 are cancelled. Claims 1-3, 5-10, 23-24, 26 and 28-30 are still pending.

Response to Amendment

Applicant's arguments with respect to amended claims 1, 7 and 23 based on the Response filed on 2/06/2007 have been considered but are moot in view of the new ground(s) of rejection.

In this rejection, examiner replaces Song (US6091464A) and Stupp et al. (US5929463A) with the better reference of **Kim et al. (US2001/0046000A1)**, which illustrates in Fig. 6 the amended features "a first opposing side of said reflecting film substantially overlapping an adjacent gate line, and a second opposing side of said reflecting film substantially overlapping an adjacent data line."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-3, 5-6, 23-24, 26, 28 and 30 are rejected under 35 U.S.C. 103(a) as being obvious over Kubo et al. (US6295109B1) in view of Kim et al.

(US2001/0046000A1) and Faris (US6133980A).

In regard to claims 1-2, 6 and 23, 24 and 26, Kubo et al. teach (Figs. 2-3 and 21-22) a transmission - reflection type liquid crystal display device comprising:

- a first transparent substrate 1;
- a second transparent substrate-2,
- a liquid crystal layer 5 between the first transparent substrate and the second transparent substrate;
- a linear polarizer 9 on the second transparent substrate;
- a circular polarizer ($\lambda/4$ wave plate 7) on an outer side of the first transparent substrate 1 according to claims 24 and 26;
- a reflecting film (reflective electrode 61 region 3R) on an inner side of the first transparent substrate adjacent to the liquid crystal layer, **the reflecting film 61 functioning as pixel electrode** and defining a light-transmitting region (transmissive electrode region 8T), wherein, as Fig. 21 shown, the light transmitting region disposed between an inner edge of a gate line and a side of

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outer edge periphery of the reflection film 61 in each pixel, an opposing side of said of reflecting film overlapping an adjacent gate line substantially.

- a $\lambda/4$ phase shift plate ($\lambda/4$ wave plate 10) between the linear polarizer 9 and the liquid crystal layer or second substrate 2; thus a circular polarizer (polarizer 9 and $\lambda/4$ wave plate 10) between the first substrate 1 and the backlight (col. 1 lines 30-35) according to claim 2.
- a transparent common electrode (transmissive electrode 4) between the linear polarizer 6 and the liquid crystal layer according to claim 6.

wherein

Claim 3:

- when a voltage is not impressed on the liquid crystal layer, the liquid crystal layer imparts or grants a phase shift of $\lambda/4$ to light transmitted through the liquid crystal layer since the retardation of liquid crystal 5 is zero when no voltage is applied (col. 10, lines 11-13).

Claim 5:

- a color filter on the reflective and transmissive electrode regions (col. 25 lines 55-58), thereby between the linear polarizer and the liquid crystal layer.

Claims 28 and 30:

- the reflection electrode 61 made of aluminum considers as the pixel electrode

However, Kobo et al. fail to disclose

- the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflecting film in each pixel, a first opposing side of said reflecting film substantially overlapping an adjacent gate line, and a second opposing side of said reflecting film substantially overlapping an adjacent data line.
- a circular polarizer made of the cholesteric liquid crystal polarizer including a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength. Since the display device is conventionally worked or performed with the visible light, which has wavelength of $\lambda=380\text{nm}-800\text{nm}$.

Kim et al. teach (Fig. 6) a liquid crystal display device with the light transmitting region disposed between an inner edge of a gate line 17 and a side of outer edge periphery of the pixel electrode 104 in each pixel, a first opposing side of said reflecting film substantially overlapping an adjacent gate line, and a second opposing side of said reflecting film substantially overlapping an adjacent data line for maximizing an aperture ratio, thus resulting high picture quality (paragraph 28 or 52).

Faris teaches (col. 2 lines 54-64) a transmission-reflection type liquid crystal display device, wherein the circular polarizer includes a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is

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wavelength $\lambda=400\text{nm}-800\text{nm}$ (in range of 380-800nm) for replacing both $\frac{1}{4}$ wave plate and linear polarizer without absorbing photonic energy and producing heat (col. 3 lines 7-10) and high brightness (col. 4 lines 64-67). Besides the right handed helical cholesteric circular polarizer transmits the left-handed circular polarization component and reflects the right-handed circular polarization component.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a transmission-reflection type liquid crystal display device as Kubo et al. disclosed with (a) a first opposing side of said reflecting film substantially overlapping an adjacent gate line, and an outer peripheral edge of a second opposing side of said reflecting film substantially overlapping an adjacent data line for maximizing an aperture ratio, thus resulting high picture quality (paragraph 28 or 52) as taught by **Kim et al.**; (b) the circular polarizer includes a right handed helical cholesteric liquid crystal having a range of pitch values p of λ/n for electro-optical display images, where n is an average index of refraction of cholesteric liquid crystal and λ is wavelength $\lambda=400\text{nm}-800\text{nm}$ (in range of 380-800nm) for replacing both $\frac{1}{4}$ wave plate and linear polarizer without absorbing photonic energy and producing heat (col. 3 lines 7-10) and high brightness (col. 4 lines 64-67) taught by Faris.

1. Claim 7-10 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo et al. (US6295109B1) in view of **Kim et al. (US2001/0046000A1)**.

In regard to claim 7, Kubo et al. teach (Figs. 21-22) a transmission-reflection type liquid crystal display device comprising

- a plurality of gate lines 53 and data lines 59a defining a plurality of pixels;
- a transistor in each pixel,
- a gate (gate electrode 52) of which is connected to a gate line and
- a second terminal (source electrode 59b) of which is connected to a data line;
- a reflecting film 61 **as functioning as a pixel electrode** formed in each pixel and connected to a third terminal (drain electrode 59c of the transistor in each pixel, an outer edge at a side of said reflecting film overlapping one of said gate lines substantially, while an outer edge at an opposing side of said reflecting film does not overlap an inner edge of an adjacent gate line,

wherein

- a light-transmitting region (region T) through which light may pass is disposed between one of said gate lines and said outer edge of said reflecting film, which does not overlap an inner edge of said adjacent gate line.

Claim 8:

- light-transmitting region (region T) exists between a data line adjacent to the data line connected to the second terminal of the transistor and the reflecting film in each pixel.

Claim 9:

- the reflecting film overlaps (not entirely) the data line connected to the second terminal of the transistor in each pixel as Fig. 8A shown.

Claim 10:

- the reflecting film overlaps (not entirely) a gate line adjacent to the gate line connected to the gate of the transistor in each pixel as Fig. 8A.

Claim 29:

- the reflection electrode 61 made of aluminum considers as the pixel electrode.

However, Kobo et al. fail to disclose the light transmitting region disposed between an inner edge of a gate line and a side of outer edge periphery of the reflecting film in each pixel, a first opposing side of said reflecting film substantially overlapping an adjacent gate line, and a second opposing side of said reflecting film substantially overlapping an adjacent data line.

Kim et al. teach (Fig. 6) a liquid crystal display device with the light transmitting region disposed between an inner edge of a gate line 17 and a side of outer edge periphery of the pixel electrode 104 in each pixel, a first opposing side of said reflecting film substantially overlapping an adjacent gate line, and a second opposing side of said reflecting film substantially overlapping an adjacent data line for maximizing an aperture ratio, thus resulting high picture quality (paragraph 28 or 52).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a transmission-reflection type liquid crystal display device as Kubo et al. disclosed with a first opposing side of said reflecting film substantially overlapping an adjacent gate line, and a second opposing

side of said reflecting film substantially overlapping an adjacent data line for maximizing an aperture ratio, thus resulting high picture quality (paragraph 28 or 52) as taught by Kim et al.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number is (571) 272-2296. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HOAN C. NGUYEN
Examiner
Art Unit 2871

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ANDREW SCHACHTER
PRIMARY EXAMINER